Project B-166-6

SMALL TOWN INDUSTRY PATTERNS AND TRENDS

Prepared for
The Georgia Department of Commerce
Abit Massey, Director

by
Robert E. Van Geuns

Engineering Experiment Station
Georgia Institute of Technology
Atlanta, Georgia

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March 1960

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Foreword

This study is one of too few completed in recent years in the industrial development field which explores new directions in which local communities and those desirous of manufacturing products in Georgia might look for opportunities. Too often the press of day-to-day activities requires that industrial development groups work only with the prospects actively seeking information. And when there are no such prospects, pressures immediately arise to go out and find some. Investigations of the sort reported here by Mr. Van Geuns therefore all too rarely can be carried out.

The additional work required to determine the extent to which these preliminary findings can be profitably pursued by local development groups seeking industries which are suitable for their communities will, we hope, be possible within the near future. The fact that the study points up so many possible opportunities in industries ordinarily not considered likely prospects for the smaller town certainly indicates the desirability of further analysis to determine precisely which types of operations can best be brought to Georgia's smaller towns.

Anyone who has an opportunity to pursue the leads presented here is urged to relay his findings to us. Comments or questions regarding the study are invited.

Kenneth C. Wagner, Head
Industrial Development Branch

Acknowledgments

We want to thank Mr. Marshall Miller for analyzing many directories of manufacturers, Miss Vivian Conklin for contributing the listings of new industries which came to small towns in Georgia and North Carolina during 1958 and the first half of 1959, and especially Mr. John Peterson for supplying the author with some valuable literature and commenting on a first draft, which caused it to be entirely rewritten. The responsibility for the views presented here remains, however, entirely the author's.

Summary

Because of reasons stated in the Introduction (and in more detail in the first part of Chapter II) the conclusions which follow can at best be considered tentative only. It will be found that the value of this report does not consist so much in indicating specific routes which a prospective manufacturer can follow automatically but in stimulating his thinking by supplying him with a great number of assorted facts and suggestions. It is recommended especially that he go through the product listings of Chapter III, and Appendices 1 and 2, not once, but several times; not necessarily because he will find there a product which he may want to make, but because the great variety of products shown might suggest to him excellent possibilities well suited to his particular circumstances.

The fact that the products listed in Chapter III are made in small towns elsewhere does not necessarily mean that they can be profitably produced in small Georgia towns. Once a tentative choice is made, the market, the distribution channels, the raw material situation, the production costs, required skills and other factors will have to be carefully studied. In Appendix 6 are listed the reports published by the Industrial Development Branch, some on specific industries or products. These are available free of charge.

One salient conclusion of the study is that the variety of products made in small towns (under 10,000 inhabitants) of industrialized regions is bewildering. It would seem that there is almost no product which is not produced in a small town. There is one factor worth remembering--that is, that the minimum size of plant in some industries is so big that its coming to a small town would automatically lift that town out of the small town category, as defined here, by attracting personnel from nearby communities. In other words, a certain industry might never be found in a town of under 10,000 inhabitants, but the town it is now in might have been in that category before the industry came there. A case in point might be a synthetic fiber plant.

In line with the present pattern of Georgia's industrial growth, good opportunities appear to exist for the following:

1. light metalworking:
    a. parts for assembly type plants in the area (see Appendix 5);
    b. tools, dies, jigs, and fixtures for these plants;
    c. specialized equipment for important Georgia or southeastern agricultural activities, like cotton pickers, automatic feeders for broilers, peanut shelling equipment, different types of harvesting equipment, chain saws, dairying equipment, etc.;
    d. die casting, precision casting;
2. plastic products of many different kinds;
3. wood products like furniture, molded wood products, wood and charcoal briquettes, etc.;
4. electronic equipment, instruments;
5. formulated chemical products like paints, cosmetics, toilet preparations, and some drugs (opportunities mainly for small towns close to metropolitan areas);
6. electrical equipment.

INTRODUCTION

This report has attempted to determine what might be promising manufacturing opportunities for small, rural Georgia towns. This is accomplished mainly by studying the situation in small towns of more industrially developed regions, and relating the findings to the general pattern of industrial growth. Its purpose is not to prove or disprove some economic theory but to stimulate the thinking of entrepreneurs, businessmen, and industrial developers, chamber of commerce executives, and sustain the prospective manufacturer's wavering courage by showing him that what he intends to do has been already successfully accomplished somewhere else.

Because part of the source material which has to be used was not too reliable, and also because of the limited time and money available for this study, it cannot pretend to be more than exploratory. It is hoped that in the future more work in this direction can be done. Such further comparative investigations will almost certainly be found rewarding and productive of practical results.

I. THE APPROACH

This report tries to determine the types of industry which should be developed or sought in small Georgia towns so as to insure the most vigorous growth of the total Georgia economy. The approach used is the comparison of industries in small Georgia (and North Carolina) towns with those in similar towns of more industrialized regions or states.

Such a comparison is meaningful only if it has first been established that industrial growth follows a fairly definite pattern. Otherwise, there would be no reason for not concluding that the towns used for comparison represent an industry pattern which might never occur during the industrial growth of small Georgia towns.

In Appendix 3 statistical support is offered to show that there is indeed such a pattern. It should be stressed, however, that important exceptions will occur, especially in directed economies, and that this pattern is by no means a law of nature or of economic growth. It is at best a phenomenon frequently observed in growing communities.

This pattern of industrial growth is somewhat as follows:

1. During the initial stages of industrial development, the food (in this country flour milling) and textile-apparel industries dominate. In forested regions woodworking might be equally important.

2. During the later stages the metalworking industries (metallurgy, metal products, machinery, including electrical machinery; transportation equipment); and the chemical industry (including plastics) increase their relative importance, finally becoming dominant, whereas the relative importance of textile-apparel and woodworking industries (sometimes also the food industries) decreases.

3. At a still later stage the electronics and instrument industries begin to increase in relative importance.

It should be noted that reference is made to "relative" increase or decrease in importance. In an absolute sense all these industries might still expand, but the rate of expansion in the metalworking and chemical industries will be greater and for the textile-apparel and woodworking industries smaller than for industry as a whole.

This gradual industrial growth, in several stages, is accompanied by:

1. an increase in per capita income;

2. an increase in population density (more people per square mile);

3. an increase in industry concentration, as reflected in such measures as value added by manufacturing per square mile. (See Appendix 3, Table 9.)

Looking at Georgia manufacturing statistics for 1947 and 1954, Table 1 shows a decrease of the relative importance of the textile-apparel and woodworking industries and a considerable increase in the relative importance of the metalworking industries. That is a healthy sign. The small towns can definitely benefit from this tendency and at the same time strengthen it by attracting and developing small metalworking industries which will supply the larger assembly type industries which have sprung up in the large centers, notably Atlanta. (Ford Motor Co. at East Point, General Motors at Doraville, Lockheed Aircraft Corp. at Marietta all are in the Atlanta area.) This point is discussed in more detail in the next chapter.

Table 1

Leading Georgia Industries Ranked
According to 1954 Value Added by Manufacture

Industry	Value Added (% of Total) 1947	1954
Textile and apparel	46.3	37.7
Food and kindred products	12.9	16.3
Transportation equipment (1)	withheld	13.2
Paper and pulp	5.3	10.0
Forest products and furniture	10.9	8.2
Chemicals	7.6	5.0
Machinery (2)	2.7	3.8
Printing and publishing	3.3	3.8
Metals and metal products, except machinery (3)	0.8	2.5
Stone, clay and glass	2.6	2.5
Total of metalworking industries (1, 2 and 3)	3.5 + withheld	19.5

Source: Census of Manufactures, 1954

Note:

The Georgia chemical industry decreased in relative importance between 1947 and 1954. That is mainly caused by the fact that fertilizer and gum and wood chemicals production are such important segments of it. Fertilizer production decreased because of the decreasing cotton acreage, and gum and wood chemicals is a line which does not show much growth and well may show a decline in the near future. Other opportunities exist in the chemicals field, however. For this reason the Industrial Development Branch is actively pursuing a study of chemical industry possibilities in Georgia.

II. INDUSTRY PATTERNS IN SMALL TOWNS

A. Sources of Basic Data

The main reason for comparing manufacturing in small Georgia and North Carolina towns with that of small towns in more industrialized regions has been explained in the first chapter. Another reason is that such a study will not only indicate general types of industrial activity but might show what types of products can and cannot be profitably produced in small town surroundings. Furthermore, it might even suggest specific products.

This latter object cannot be achieved using data from the 1954 Census of Manufactures. There statistics for individual counties are broken down by major (two digits) industries only; in other words, they do not go beyond a very broad classification.

Directories of manufacturers for industrial states, on the other hand, especially those for states in the main manufacturing belt, are extremely detailed, listing thousands of different products. They do not always indicate, however, the number of employees for each firm. Therefore, the choice remained of either (1) using Census data which permit the ranking of the industrial activities by number of employees or value added, but only suggest very broad fields of endeavor for small Georgia towns; or (2) using those directories which permit only ranking industries by number of establishments but might indicate what types of products are suitable or unsuitable for small town manufacture and might even suggest specific products.

Because the approach here is primarily a practical one and this report is directed to the manufacturer, prospective manufacturer, entrepreneur, industrial development and chamber of commerce executives, and not to the theoretical economists, directories of manufacturers were chosen. This was done in full realization that ranking of industries by number of establishments (the only ranking possible using directories) is not too satisfactory. In order to compensate somewhat for this shortcoming, data on per cent of the total number of establishments and number of employees for the states studied here were compiled from the 1954 Census. These are shown in Tables 2 and 3. They will at least indicate in what direction per cent figures for number of establishments for small towns will differ from per cent figures for number of employees for the same towns.

Table 2

NUMBER OF INDUSTRIAL ESTABLISHMENTS BY TYPES,
SOUTHEAST AND NORTHEAST

State	Electrical	Metal-working	Furniture	Food	Textiles-Apparel	Stone, Clay
	SIC No.	SIC No.	SIC No.	SIC No.	SIC No.	SIC No.
	36	33,34, 35,37	25	20	22, 23	32
			Percentage of Total			
Southeast						
Alabama	0.7	17.9	4.7	23.9	10.9	8.5
Florida	1.5	17.6	8.1	19.8	7.4	8.4
Georgia	0.9	12.2	5.3	23.3	18.5	6.9
North Carolina	0.7	9.9	9.7	19.2	28.0	5.3
South Carolina	0.2	9.1	3.6	23.6	26.7	6.0
Tennessee	1.7	20.2	8.7	33.8	15.1	8.8
North						
Illinois	4.3	30.8	3.8	12.8	7.9	3.6
Michigan	2.0	47.2	3.4	14.2	2.8	4.4
Ohio	2.6	38.0	2.8	15.1	4.0	6.3
Pennsylvania	2.1	22.8	3.6	16.8	20.0	5.4
Wisconsin	2.3	26.2	2.5	31.0	4.0	4.2

Source: Census of Manufactures, 1954

Table 3

TOTAL EMPLOYMENT FOR DIFFERENT TYPES OF INDUSTRY,
SOUTHEAST AND NORTHEAST

State	Electrical	Metal-working	Furniture	Food	Textiles-Apparel	Stone, Clay
	SIC No.	SIC No.	SIC No.	SIC No.	SIC No.	SIC No.
	36	33,34 35,37	25	20	22,23	32
			Percentage of Total			
Southeast						
Alabama	1.3	32.4	1.0	8.2	33.3	3.8
Florida	0.8	14.7	4.1	26.7	5.6	4.7
Georgia	0.9	13.7	2.5	12.4	50.2	2.6
North Carolina	2.7	3.2	8.1	6.1	59.7	1.6
South Carolina	(not disclosed)	1.8	1.2	4.4	72.2	2.0
Tennessee	1.6	17.0	4.0	11.0	24.4	3.4
North						
Illinois	11.8	39.6	2.3	11.9	5.2	2.8
Michigan	2.1	71.2	2.1	5.7	1.3	1.7
Ohio	7.0	53.0	1.7	6.5	3.0	5.1
Pennsylvania	7.4	40.8	1.6	8.0	18.2	4.6
Wisconsin	8.4	40.9	2.5	14.9	3.8	1.1

Source: Census of Manufactures, 1954

Note:

The totals of Tables 2 and 3 do not include SIC classifications 2411 and 2421, logging camps and contractors and sawmills and planning mills. The column "Woodwork" of Table 4 does not include these categories either.

Another weakness of many directories is that they do not always make a clearcut distinction between manufacturers and distributors. Because this study uses only comparative figures, which are per cent of totals, the influence of such errors in classification will probably not be too serious. Because of these inadequacies of our basic sources of information, this study has to be considered as exploratory only, however.

B. Comparison of Georgia and North Carolina Small Towns With Those of Parts of Illinois, Michigan, and Wisconsin

Table 4 shows the pattern of industry (based on number of establishments) for a sample of small Georgia and North Carolina towns and similar towns in Illinois, Michigan, and Wisconsin. "Small town" is defined here as any town or village with 10,000 or less inhabitants.

One characteristic of Georgia is its large forest area (approximately two thirds of its total acreage). In order, therefore, to avoid the objection of comparing regions which are dissimilar in such an important characteristic, towns were selected in the northern states in those regions which have extensive forests--that is, the northern parts of Wisconsin and Michigan and the southern tip of Illinois. This choice has another advantage: None of these forested districts is within the main manufacturing belt proper.[1/] In other words, the comparison is less extreme, and therefore probably more useful.

The most striking difference in the industry pattern between North and South is the much higher relative number of establishments in the textile-apparel industry in the South and the much higher relative number of metalworking firms in the North. This is in line with what was pointed out in Chapter I. It shows, furthermore, that the pattern for small towns is similar to the pattern for the whole corresponding region. It is interesting to note that the small towns within 25 to 30 miles of population centers (more than about 50,000 inhabitants) have more metalworking than woodworking establishments; whereas for the isolated towns the figures are almost the same, with the woodworking plants having a small advantage.

This predominance of metalworking in the North against textile-apparel in the South is, of course, not unexpected. Nevertheless, it was worthwhile

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1/ "Economic Geography," by Dicken, Heath and Co., 1955, fig. 37.1.

Table 4

NUMBER OF MANUFACTURING PLANTS BY TYPES AS PER CENT OF TOTAL FOR DIFFERENT STATES

State	Electronics	Electrical	Plastics	Woodwork	Metal	Furniture	Food	Textile Apparel	Sand Stone Clay Cement	Miscellaneous
Florida										
Metropolitan	--	--	--	12.5	15.6	3.1	14.1	3.9	14.1	36.7
Isolated	--	--	--	14.7	11.0	5.5	23.9	2.8	16.5	25.7
Georgia										
Metropolitan	--	--	1.1	14.3	5.5	0.0	26.4	25.3	17.6	11.0
Isolated	--	--	0.0	15.9	6.5	2.9	26.8	18.1	6.5	23.2
North Carolina										
Metropolitan	3.6	0.0	0.0	10.7	7.1	14.3	3.6	42.9	3.6	14.3
Isolated	0.0	1.2	0.0	1.2	6.0	20.5	26.5	27.7	7.2	9.6
Illinois, Michigan, Wisconsin (Forested parts)										
Metropolitan	--	--	--	11.1	46.3	0.0	9.3	6.5	12.0	14.8
Isolated	--	--	--	25.2	23.6	3.1	15.0	4.7	11.0	17.3
Ohio (more than 100 employees)										
Metropolitan	0.7	2.1	0.7	0.7	30.3	4.9	16.2	1.4	13.3	29.6
Isolated	--	12.1	0.8	0.9	33.1	1.6	12.1	8.1	20.2	12.1
Oregon, Washington										
Isolated	0.0	0.0	0.0	31.2	18.8	--	18.8	--	22.9	8.3

to establish this fact for small towns, because of the belief frequently encountered in the Southeast that metalworking activities are not suitable for small towns, especially when they are not supported by a heavy metal industry in the nearby metropolitan areas.

To investigate this last point, statistics were compiled on manufacturing activities in small isolated towns in Oregon and Washington. Neither Portland nor Seattle has an important heavy metal industry. Table 4 shows the results. Note also that there is a much higher percentage of metalworking plants in the northwestern towns than in Georgia small towns and the percentage is not far below that of small isolated towns in Illinois, Michigan, and Wisconsin. In addition, there is a higher percentage of woodworking plants. This compensated for the absence of the textile-apparel industry. In other words, metalworking in small towns can develop without the support of a metropolitan heavy metal industry in the same area.

C. Industries With 100 or More Employees in Ohio Small Towns

Some people seem to feel that the chances for a small town to attract a sizable industry are very slim and that such industries are limited to pulp manufacturers, lumber yards, textile-apparel producers and the like. Therefore, plants which employ more than 100 employees in the small towns of a highly industrialized region were studied. The choice was Ohio, for the following reasons:

1. Ohio is a highly industrialized state.

2. Ohio has an area of the same order of magnitude as Georgia; 41,000 as compared 58,000 square miles.

3. Ohio is not completely dominated by one (or two) gigantic metropolises as Illinois is by Chicago, as Michigan is by Detroit, as New York is by New York City, and Pennsylvania is by Philadelphia and Pittsburgh. It is, of course, true that Atlanta has a dominating influence in Georgia, but not to the same extent in manufacturing, especially, as the examples above. Table 5 shows this.

Table 5

	Metropolitan Areas			
	Chicago	Detroit	Cleveland	Atlanta
All manufacturing employees as percentage of state total	80.1	53.8	23.0	25.9
Value added by manufacture as percentage of state total	81.6	54.2	23.6	34.7

The data of Table 4 indicate a high per cent of metalworking industries. The isolated towns have, furthermore, strong electrical machinery and appliances industries, while the metropolitan oriented towns have strong food and miscellaneous industries. Both groups have well developed sand, stone, clay and cement industries.

This tabulation shows again that small towns can have not only metalworking industries but sizable ones as well.

The relatively large number of electrical machinery and appliance manufacturers in isolated small towns in worth noting.

D. New Industries Coming in Recent Years to Georgia, North Carolina, and Pennsylvania Small Towns

Besides comparing actual conditions in the Southeast and the North, the study also compared trends.

Table 6 shows new plants which came to Georgia and North Carolina small towns in the last one and one half years and to Pennsylvania during 1958. Pennsylvania was chosen here for the simple reason that data about its new industries were readily available.

The comparison shows that Georgia small towns are apparently gradually heading in the right direction--that is, developing higher wage industries; North Carolina small towns, on the other hand, seem to be going in the wrong direction. Georgia small towns are now adding a substantial number of metalworking industries, although they are still below the number of textile-apparel plants. North Carolina small towns are still adding mostly textile-apparel plants, which accentuates its heavy dependence on this industry. This is probably one of the reasons that per capita income in North Carolina shows such a very slow rise.

It has to be observed, however, that the future for North Carolina as a whole is somewhat better, since its larger towns (over 10,000 population) have secured a fair share of metalworking plants.

The adding of some small electronics and plastics plants to the Georgia economy is encouraging. It is understandable that Pennsylvania shows higher percentages in those lines.

The total number of new plants was: Georgia, 128; North Carolina, 120; and Pennsylvania, 99. It should be remembered that these absolute figures are less reliable than the percentage figures and further, that the Georgia and North Carolina figures cover a 14-month period and the Pennsylvania figures a 12-month period.

Table 6

NEW INDUSTRIES JANUARY 1957-JUNE 1959
(Except September 1957, February and November 1958, April 1959)
(Number of plants as per cent of total)

State	Electronics	Electrical	Plastics	Wood-working and Lumbering	Metal-working	Furniture	Food	Apparel	Sand Stone Clay Cement	Miscellaneous
Georgia	1.6	0.0	0.8	9.4	23.4	3.9	13.3	29.7	2.3	15.6
North Carolina	1.7	0.8	0.0	11.7	4.2	5.0	15.0	45.8	2.5	13.3
				New Industries During 1958						
Pennsylvania	3.0	3.0	6.1	6.1	29.3	6.1	1.0	15.1	7.1	23.2
Metropolitan	1.3	2.6	3.9	2.6	31.1	6.5	1.3	18.1	7.8	24.6
Isolated	9.1	4.5	13.6	18.2	22.7	4.5	0.0	4.5	4.5	18.2

Source: Georgia and North Carolina: Industrial Development magazine, monthly issues of the period.
Pennsylvania: Industrial Development Project announced in Pennsylvania, January 1-December 31,1958
Pennsylvania Department of Commerce, Bureau of Industrial Development, Harrisburgh, Pennsylvania

III. SUGGESTIONS FOR PRODUCT LINES OR INDIVIDUAL PRODUCTS

Tables 1 through 4 in Appendix 1 indicate interesting products made in such highly industrial states as Illinois, Michigan, Ohio, and Pennsylvania, as well as in a moderately industrialized state like Wisconsin and a rapidly growing state like Florida. Tables 5 and 6, Appendix 1, show woodworking and metalworking firms in the forested parts of Illinois, Michigan, and Wisconsin.

A careful study of these lists will be rewarding. The main impression which will remain is the staggering variety of products, which contradicts the feeling of many people that only certain special products can be made in a small town environment. One is led, on the contrary, to the opposite conclusion--that almost every product can be made and is being made in small towns.

It would be helpful to extend this study by determining what kinds of industries have been particularly successful in small town environments and why. This was, however, far beyond the time and budget limitations imposed. Some products which do seem of particular interest are:

1. electric lamps;
2. plastic foams;*
3. plastic products in general;*
4. instruments in general (those interested in this field should read the case study: "The Yellow Springs Instrument Company"[1/]);
5. electronic equipment;*
6. die casting;*
7. precision casting (for an interesting case study in this field, see "The Antioch Foundry--Morris Bean and Company"[1/]);
8. animal feeders;*
9. tools and dies;
10. women's heels, shoe lasts and window units in the woodworking field;*
11. specialty paints and a combined paint making decorating service.*

For those marked with an asterisk, the Industrial Development Branch has completed, or has underway at the present time, reports relating to the specific product or industry. (See Appendix 6 for a listing of these reports and their availability.)

1/ "Industries for Small Communities," by Arthur E. Morgan, published by Community Service, Inc., Yellow Springs, Ohio, 1953.

Finally, Appendix 2 contains a list of small manufacturing possibilities for small towns. They are all fields of endeavor which can be started with a relatively small investment. This is not to say that all are in actuality promising ventures. That would have to be investigated for each particular product. Many of them require special skills. The main purpose of the list is to stimulate thought and to draw attention to ways and means of finding gainful employment for people outside of the agricultural field and without depending on outside industries.

Systematic analysis of (1) the location requirements for such manufacturing operations, and (2) of the resources of interested communities will be required, of course, to determine the "best bets" for any particular town.

APPENDICES

APPENDIX 1

Appendix Table 1

INDUSTRIES IN TOWNS OF 10,000 OR LESS

Forested Parts of Illinois, Michigan and Wisconsin

A. Towns close to larger centers

Product	Number of Employees
Advertisement caps and aprons, news bags, laundry bags, danger flags	NA
Aluminum boats	100
Aluminum castings	35
Aluminum combination storm windows, awnings (aluminum, fibre glass)	5
Anodes, plating supplies, hammers, forging aluminum, brass, copper	NA
Archery equipment	NA
Automotive hardware, plumbing hardware	NA
Brakes (air) and brake linings	150
Candy	30
Die casting	NA
Die casting, aluminum and magnesium	4
Exhaust mufflers	105
Feeders and waterers for hogs and poultry crop feeders, feed scoops, rat cafeterias	11
Funeral equipment	7
Jigs and fixtures	NA
Jigs and fixtures, tools and dies, fabrications	35
Jigs, fixtures, gauges, wheels, tools	7
Jigs and fixtures, machine products, special machinery	NA
Leather work, gloves, and jackets	NA
Materials handling equipment, metal products, fire fighting equipment	16
Materials handling equipment, dockboards, ramps, bridges	NA
Milking machines, barn cleaning equipment	NA
Neon signs	NA

Perfume	NA
Plastic molding	NA
Precision machine parts (branch plant)	57
Racks	NA
Seed cleaning machinery	NA
Saw blades (carbide tipped), cutting tools	NA
Screw machine products	NA
Screw machine products, auto	NA
Screw machine parts	25
Stainless steel food service equipment for restaurants, bars, hospitals, etc.	NA
Tools	NA
Tubing (metal) fabrication	NA
Truck bodies, trailer bodies	35
Truck cabs and bodies (insulated, refrigerated) barn cleaners	42
Trailer hitches	NA
Transport bodies, spreaders, conveyors, unloaders, handling equipment	NA
Water heaters (electric and gas): domestic, milk house, table top, commercial: water softeners	17
Water pumps, assemblies, generators, parts, machining	6
Water systems, cellar drains, pumps, sprinklers	12
Woolen hosiery, gloves and mittens, leather gloves, slipper socks, athletic socks, casual shoes, hunting mitts and gloves, ski mitts, golf club head covers	250

B. Isolated Towns:

Product	Number of Employees
Abrasives	10
Automobile accessories	NA
Bearings, bits, boring bars, boring parts, cutters, tool holders	50
Boat trailers	17
Bowling pins	18
Bowling pins, shoe lasts, women's heels	110
Castings (precision)	28
Controls, control equipment	475
Feed (poultry, dairy, fish, rabbit, dog, fur bearing animals)	59
Furnace work, sheet metal work	NA
Gears: truck transmission and trailer gears, speed reducers, worms, worm gears, sprockets, shafts (helical), spur gears, spline	19
Lamps (floor, bridge, table) furniture, tables, wood turnings	30
Marine equipment, winches, windlasses, steering gear, towing machinery, cargo handling gears, gray iron castings, conveyors, industrial equipment, plates	464
Materials handling equipment	27
Paint	13
Paints, enamels, metal finishes, adhesives, chemical specialties	NA
Plaster products	10
Plastics, baits, fishing lures, gaff hooks, pliable plastic products	NA
Signs	NA
Tools and dies	15
Tools, controls, marine equipment, mining machinery, conveyors, industrial equipment	22
T.V. antennas and accessories	50
Weatherstrip	225
Wooden brush and squeegee blocks, pulley sheaves	12
Wood fibre	37
Wooden ware (hand decorated), salad bowls, restaurant specialties of wood, maple chipping blocks and cutting boards	16

Appendix Table 2

INDUSTRIES OF 100 OR MORE EMPLOYEES
IN OHIO TOWNS OF 10,000 OR LESS

A. Towns close to larger centers

Product	Number of Manufacturers
Aircraft	1
Ammunition	1
Agricultural Equipment & Supplies	2
Auto Parts & Supplies	2
Fatty Acids	1
Furnaces	1
Heat Treating	2
Lighting Fixtures	1
Matches	1
Pharmaceuticals	1
Photo Equipment & Supplies	1
Plastics	1
Railroad Equipment & Supplies	2
Rubber Products	10
Scientific Instruments	1
Tires & Tubes	1

B. Isolated towns

Aircraft Parts & Supplies	1
Agricultural Equipment & Supplies	2
Auto Parts & Supplies	2
Boilers	1
Bolts & Nuts	1
Communication Equipment	1
Electric Appliances	1
Switch Gears & Switch Board	1
Enameled Ware	2
Enameling	1
Lamps (G.E.)	3

Product	Number of Manufacturers
Lighting Fixtures	3
Machine Tools	1
Motor Vehicles	2
Plastics	1
Radio, TV, Supplies (parts)	1
Railroad Equipment & Supplies	1
Refractories	4
Rubber Products	4
Scientific Instruments	1
Tools	4
Tires & Tubes	1

Appendix Table 3

INDUSTRIES WHICH CAME DURING 1958
TO PENNSYLVANIA TOWNS OF 10,000 OR LESS

A. Towns close to larger centers

Products	Number of Employees
Bearings	25
Church furniture	75
Coffee processing	NA
Concrete pipe	50
Construction equipment	150
Conveyor belts	30
Electrical measuring instruments	450
Farm machinery	35
Floor sweeping compounds	35
Foam plastic	50
Fractional horsepower motors	450
Garden tools	40
Gun barrels	NA
Instruments	NA
Materials handling equipment	200
Missile parts	230
Pharmaceuticals	NA
Plastic coated wire	NA
Pre-Cut Homes (2)	40
Pyrometric accessories	18
Railroad supplies	NA
Thermostat controls	1,300
Tools, dies & jigs	15
Toys	45
Watch movements	100
Wood & aluminum ladders	16
Zinc and by-products	28

B. Isolated towns

Product	Number of Employees
Bookbinding	60
Butane lighter refills	12
Electronic equipment	50
Electronics	40
Fishing lures	NA
Garden tool handles	50
Glass to metal seals	25
Kitchen cabinets	60
Milk dispensers	20
Plastic film	200
Plastic novelties	50
Radio & electronic parts	275
Reconditioned bowling pins	25
Transformers	70
Steel rolls	NA
Wire recovery	20

Appendix Table 4

INDUSTRIES IN FLORIDA TOWNS OF 10,000 OR LESS

A. Towns close to larger centers

Products	Number of Employees
Printing inks	25
Candy	50
Concrete brick	16
Tobacco processing	NA
Edge tools	NA
Reeds for music instruments	5
Fabricated structural steel	25
Coloured shells	5
Vinyl plastic sheets	50
Packaging equipment	NA
Industrial & dish towels Polishing cloths	25
Conveyors	15
Switchgear & industrial controls	50
Jams, jellies, marmalades	6
Jalousies	10
Aluminum & canvas awnings Canvas umbrellas	8
Post cards	NA
Aluminum castings	5

B. Isolated towns

Automobile stampings	NA
Tung oil	NA
Electroplating	5
Tomato packing & shipping	NA
Heating apparatus, gas & electric Oil tanks	NA
Aluminum screens	5
Electric vehicles	5

Appendix Table 5

FIRMS MAKING PRODUCTS FROM WOOD IN TOWNS
WITH LESS THAN 10,000 INHABITANTS

Forested Parts of Illinois, Michigan and Wisconsin
27 Isolated and 21 Non-Isolated Towns

Product	Towns		Total
	Isolated	Non-Isolated	
Archery equipment	1	1	2
Bars	1	-	1
Basket handles	1	-	1
Blocks (one maple chipping)	3	-	3
Boxes and crates	4	-	4
Box and crate shook	1	-	1
Bar sticks	1	-	1
Boats (1 Cedar strip boats)	1 (Cedar)	3	4
Bowling pins	2	-	2
Cabinets	6	3	9
Casement units	1	-	1
Counter tops	1	-	1
Creosoted wood	-	1	1
Doors (one garage door sections)	5 (one garage)	2	7
Dowels	1	-	1
Floors	2	-	2
Frames	2	-	2
Furniture (one church)	6	-	6
Industrial parts	1	-	1
Interior trim	2	-	2
Hand decorated wooden ware	1	-	1
Heels, women's	1	-	1
Kitchen equipment	1	-	1
Laminated products, plywood, veneer	2	-	2
Lamps	1	-	1

Mouldings	4	1	5
Maple cutting boards	1	-	1
Medical swab sticks	1	-	1
Pallets	2	-	2
Paneling, solid	1	-	1
Poles (telephone)	-	1	1
Posts	-	1	1
Pulley sheaves	1	-	1
Restaurant specialties	1	-	1
Salad bowls	1	-	1
Sashes	3	-	3
Signs	1	1	2
Shoe lasts	1	-	1
Specialties	1	-	1
Stanchion liners	1	-	1
Tables (1 bridge)	3	-	3
Ties	3	1	4
Turnings	1	-	1
Window units, windows	2	1	3
Woodfiber	1	-	1

Firms are counted for every product they make. The total of the column "Total" is therefore considerably more than the actual number of firms.

Appendix Table 6

FIRMS MAKING METAL PRODUCTS IN TOWNS
WITH LESS THAN 10,000 INHABITANTS
(in Michigan, Illinois, and Wisconsin)

Product	Towns		Total
	Isolated	Non-Isolated	
Air brakes	-	1	1
Aluminum awnings	-	1	1
Aluminum boats	-	1	1
Aluminum castings	1	1	2
Aluminum storm windows	-	1	1
Animal feeders	-	1	1
Anodes	-	1	1
Automotive hardware	1	1	2
Bearings	1	-	1
Bits	1	-	1
Boat trailers	1	-	1
Carbide tip saw blades	-	1	1
Casement windows	1	-	1
Cellar drums	-	1	1
Conveyors	1	2	3
Cutting tools	-	1	1
Die castings, aluminum & magnesium	-	1	1
Engineering foundry	-	1	1
Exhaust mufflers	-	1	1
Fabrications	-	3	3
Forgings (aluminum, brass, copper)	-	2	2
Foundry supplies	-	1	1
Frames	-	1	1
Funeral equipment	-	1	1
Gauges	-	1	1
Gears	1	-	1
Generators	-	1	1
Grey iron castings	2	2	4

Hammers	-	2	2
Handling equipment	1	2	3
Iron ore	2	-	2
Iron work	1	-	1
Jigs and fixtures	1	2	3
Maciined parts	1	-	1
Machine parts	1	3	4
Machinery	1	7	8
Machine work	3	3	6
Marine equipment	2	-	2
Metal finishing	-	1	1
Metal products	-	3	3
Metal specialties	2	-	2
Metal tubing	-	1	1
Milking machines	-	1	1
Milling cutters	1	-	1
Plating supplies	-	1	1
Plumbing supplies (hardware)	-	1	1
Refrigerators	-	1	1
Screw machine parts	-	2	2
Shafts (engine)	1	-	1
Sheet metal	-	1	1
Sheet metal works	-	2	2
Shields	1	-	1
Spreaders	-	1	1
Sprinklers	-	1	1
Stainless steel food service equipment	-	1	1
Tables	-	1	1
Tool holders	1	-	1
Tools	2	7	9
Tractor hitches	-	1	1
Transmissions	1	-	1
Transport bodies	1	4	5
Unloaders	-	1	1
Watch bands	1	-	1

Water pumps	-	1	1
Water systems	-	1	1
Welding	1	3	4
Wheels	-	1	1
Worm gears	1	-	1
TOTAL	36	84	120

Firms are counted for every product they make. The total of the column "Total" is therefore considerably more than the actual number of firms.

APPENDIX 2

SMALL SCALE MANUFACTURING POSSIBILITIES FOR SMALL TOWNS

A. Based on Wood

Hand made quality furniture, furniture parts on a contract basis

Quality trays, cups, spoons, plates, bowls, dishes, and ornamental objects for the home

Tool handles

Cabinets

Brooms and mops

Picture frames, possibly on contract basis

Patterns, possibly on contract basis

Artificial limbs

B. Based on Metal

Simple tools

Simple type agricultural implements

Shovels, scoops, forks, etc.

Tinsmith work

Metal plating

Small objects for the home or office, like bookstands, hangers, wire baskets, lamp stands, fireplace screens, ornamental objects, ornaments for gates, doors, fences, etc., perhaps on a contract basis.

Patterns, possibly on a contract basis

Precision casting

Novelties

Advertising signs

Roof ventilators, mail boxes, window screens

Steel kitchen cabinets

Chicken feeders, brooders and fountains

A welding shop

Store and commercial fixtures, parts for same on contract basis

C. Based on Synthetic Resins

Novelties

Toys

Specialized light fixtures

Small, practical, ingenious gadgets for the home or office

Small objects to be used as gifts for advertising purposes

D. Based on Clay

Artistic, hand made and decorated dinnerware, tea and coffee sets

Fine chinaware

Decorative tiles

High grade pottery

Special cements for jewelers, dentists and instrument makers

Brick

E. Based on Edible Materials

Specialties like home made style jellies and jams, containing only natural high quality ingredients, dietary products

Special, tasty cookies, catering to local snackbars, restaurants and hotels, as well as the homes

Peanut shelling

Grist mill

Animal and poultry feeds, perhaps preparing them under contract for local cooperatives

Custom slaughtering

F. In the Textile and Related Fields

Hemstitching, embroidering and button holing

Mattress renovating and repair

Wearing apparel contract work

Women's sweaters and children's clothing, possibly as contract work

G. Based on Chemicals

Formulation of insecticides and fertilizers for cooperatives
Some cosmetic or toilet specialty
Veterinary products under contract with some cooperative
Poultry house sprays
Rust solvents
Extraction of essential oils
Extracts from medicinal herbs, perhaps on a contract basis
Hormones
A specialty paint; combined paint manufacturing-decorating service
Photographic glues, colors, and print finishing materials
A specialty wax or polish

H. Miscellaneous

Objects made from leather, as belts, book covers, page indicators, fancy jackets, etc.
Luggage, high quality, hand made
Recapping
Neon signs
Ornamental plaster products
Photo engraving
Precious stone cutting, jewelry engraving
Venetian blinds
Window shades
Concrete blocks and pipe

APPENDIX 3

PATTERN OF INDUSTRIAL GROWTH

In Chapter I a pattern of industrial growth has been indicated. Here some statistical data are presented to support that view.

Appendix Table 7 shows total value of finished products turned out by different divisions of industry in the years 1869, 1899, and 1929. In 1869 the four metalworking industries combined already had an output of the same value as the textile-apparel industries, though still far below that of the food industries. Unfortunately, no figures are available for earlier years. They would probably show that in the beginning of the 19th century the combined metalworking industries produced considerably less value than textiles-apparel.

The situation in 1899 is basically the same as in 1869, but in 1929 the combined metalworking industries not only surpassed the textile-apparel industry but even the food industries. For later years figures on output of finished products by industry are not available and have to be replaced by value-added-by-manufacture figures. These in turn are not available for earlier years. Appendix Table 4 shows the situation for later years based on value added by manufacture. Values added by manufacture give, of course, a somewhat different ranking. The figures show, nevertheless, the same picture: the growing importance of the metalworking and chemical industries compared with the textile-apparel and food industries. Focusing attention on these industries alone (Appendix Table 9) the increasing importance of the metalworking and chemical industries is noticed.

Corresponding figures for Georgia are given in Table 1, Chapter I. The dominance of the textile-apparel industry and the relatively small though increasing importance of the metalworking industries can be seen at once. It is extremely interesting to compare the United States and Georgia data with those of a country like Brazil, (see Table 10) which is still in the initial stages of industrial development.

Appendix Table 7

VALUE OF FINISHED PRODUCTS BY INDUSTRY AS PER CENT OF TOTAL FOR THE UNITED STATES

Industry	1869		1899		1929	
	(Per Cent of Value of Total Output)					
Food	27.0		32.0		23.0	
Tobacco	2.9		3.9		3.3	
Textiles and apparel	9.9		12.0		12.9	
Furniture, fixtures	2.9		1.9		2.6	
Printing and publishing	1.5		1.8		3.1	
Leather, shoes	7.1		5.0		3.0	
Stone, clay and glass	1.0		1.0		0.8	
Fabricated metal products	1.0		0.9		0.8	
Machinery, except electrical	6.0	11.3	6.0	11.9	9.2	25.4
Electrical machinery	0.0		0.9		3.9	
Transportation	4.3		4.1		11.5	
Instruments	0.1		0.2		0.5	

Source: Historical Statistics of the U. S., 1789-1945
U. S. Dept. of Commerce, Bureau of the Census

Appendix Table 8

LEADING U. S. INDUSTRIES RANKED ACCORDING TO VALUE ADDED BY MANUFACTURE

Rank	1923 Industry	1923 Value Added (% of Total)	1947 Industry	1947 Value Added (% of Total)	1954 Industry	1954 Value Added (% of Total)
1.	Textiles and apparel	15.9	Machinery	15.7	Machinery	16.9
2.	Metal products, excl. machinery	13.6	Metal products, excl. machinery	14.4	Metal products, excl. machinery	14.5
3.	Machinery	11.2	Textiles and apparel	13.2	Transportation equipment	11.9
4.	Food and kindred prods.	9.7	Food and kindred prods.	12.1	Food and kindred prods.	11.5
5.	Forest products & furniture	7.4	Transportation equipment incl. autos	7.9	Textiles and apparel	8.5
6.	Transportation equipment incl. autos	7.4	Chemicals	7.5	Chemicals	8.0
7.	Printing and publishing	6.2	Printing and publishing	5.8	Printing and publishing	5.4
8.	Chemicals	4.6	Forest products & furniture	5.2	Forest products & furniture	4.4
9.	Stone, clay, glass prods.	3.9	Paper & allied products	3.9	Paper and allied products	3.9
10.	Railroad repair	3.5	Stone, clay, glass prods.	3.1	Stone, clay, glass prods.	3.3

Sources: 1923 -- The World Almanac and Book of Facts

1947) 1954) -- Census of Manufactures

Appendix Table 9

Industry	United States 1923	1947	1954
	(Per Cent of Total Value Added)		
Primary metal products, machinery, transportation	32.2	38.0	43.3
Textiles-apparel	15.9	13.2	8.5
Food	9.7	12.1	11.5
Chemicals	4.6	7.5	8.0

Appendix Table 10

Industry	Brazil 1919	1939	1949	
	(Per Cent of Total Value Added)			
Food and beverages	28.6	26.9	17.4	
Textiles-apparel	36.4	23.9	24.8	
Metallurgy and metalworking	6.0	11.7	12.4	)
Electrical apparatus	--	--	1.9	) 14.3
Chemicals, including rubber goods and paper	9.0	11.5	15.9	
Tobacco	5.3	--	2.1	
Ceramics and cement	3.8	4.7	4.5	
Printing	--	3.2	2.0	
Tanning and leather industries	1.8	1.5	1.2	
Lumber and manufacture of wood products	5.2	4.8	2.2	

Source: "Economic Growth: Brazil, India, Japan," edited by S. Kuznets, W. E. Moore and J. J. Spengler, Duke University Press, 1955, p. 71.

Again the dominance of the textile and food industries, the rise of the metalworking and chemical industries, and the relative decline of the textile and woodworking industries (and in this case the food industries) are apparent.

It might be argued that the metalworking industries can only develop in a coal-iron ore region or close to it. That this is not correct is proven by the example of Massachusetts, where the metalworking industries contribute 39.2 per cent of the value added by manufacture against 13.8 per cent contributed by textiles and apparel. Massachusetts is not particularly close to the coal-iron ore region.

It is true that no heavy metal industries of importance now exist outside the coal-iron ore regions (unless artifically fostered as in some planned economies). However, the development of new techniques for reducing iron ore, which do not require coke or large amounts of coke, is expected to make decentralization of the steel industry possible. If this occurs, rapid development of metalworking plants can be expected in areas where such development would otherwise likely be comparatively slow.

Appendix Table 11

GENERAL STATISTICS OF SOUTHEASTERN
AND SOME NORTHERN STATES, 1956

A. Basic Figures

	Land Area Sq. Miles	Population	Value Added By Manufacturing
Alabama	51,078	3,121,000	$ 1,589,302,000
Florida	54,262	3,885,000	1,130,318,000
Georgia	58,484	3,709,000	2,093,277,000
North Carolina	49,097	4,406,000	2,742,276,000
South Carolina	30,305	2,329,000	1,386,024,000
Tennessee	41,797	3,420,000	1,986,085,000
Illinois	55,935	9,482,000	11,694,472,000
Michigan	57,022	7,580,000	10,066,544,000
Ohio	41,000	9,071,000	12,371,767,000
Pennsylvania	45,045	10,940,000	12,017,616,000
Wisconsin	54,705	3,788,000	3,948,529,000

B. Derived Figures

	Inhabitants Per Sq. Mile	Value Added Per Sq. Mi.	Value Added Per Capita	Value Added Per Worker	Production Workers Per 1,000 Inhabitants	Per Capita Income
Alabama	61	31,100	510	8,070	63	1,254
Florida	72	20,800	290	10,200	29	1,755
Georgia	64	35,800	560	7,250	78	1,412
N. Carolina	90	55,700	620	6,680	93	1,333
S. Carolina	77	45,600	590	6,970	85	1,157
Tennessee	82	47,400	580	8,700	67	1,347
Illinois	169	209,000	1,230	11,970	103	2,385
Michigan	133	176,000	1,330	12,270	107	2,158
Ohio	221	301,000	1,360	11,810	116	2,184
Pennsylvania	243	267,000	1,100	9,940	110	2,027
Wisconsin	69	72,300	1,080	10,800	92	1,872

	Farm Employment Per 1,000 Workers
Southeast	58
East North Central	36

Sources: Statistical Abstracts of the United States
The World Almanac and Book of Facts

APPENDIX 4

BIG CITY VS. SMALL TOWN AS A PLANT LOCATION

When a plant location decision involves the alternatives of a large city or a small town, what are the factors to be weighed?

A plant probably belongs in a large city if it needs;

1. Maximum transportation facilities for people and goods.
2. Immediate availability of a variety of supplies, parts, and materials.
3. Speedy communication by mail, telegraph, and telephone.
4. Close contact with individuals and groups in related business fields.
5. Maximum banking and other financial facilities.
6. Specialized services such as testing laboratories, computers, etc.
7. Extensive information sources including technical libraries and archives.
8. Comprehensive professional counsel - legal, medical, engineering, etc.
9. Extensive maintenance and repair services.
10. Close access to major educational and scientific institutions.
11. Wide range of labor skills.
12. Metropolitan amenities including large hotels, clubs, amusements, etc.
13. Convenient access for business visitors.
14. Complete municipal services including water, sewers, power, gas, fire and police protection, waste disposal, etc.

(Complete municipal services are sometime available in small communities but they are seldom adequate for much growth.)

A Plant probably belongs in a small town if it needs:

1. Maximum labor stability.
2. Freedom from restrictive union practices.
3. Relatively lower wage rates.
4. Minimum land costs for expansion.
5. Company prominence in community affairs.
6. Freedom from congestion.
7. Generally lower local tax rates.
8. Country living environment.
9. Community support for plant.

To enjoy some of the advantages of both, many plants choose suburban locations - in small towns near the big cities. Where sites in well-planned industrial districts are available, such locations are often desirable, but single small sites may become unsuitable as urban growth surrounds them.

Few big cities have any effective means, except by slow and costly urban redevelopment, of providing space for their growing industries or for new ones. Most of the older manufacturing plants are structurally obsolete, and most of the warehouse buildings have low ceilings or narrow bays that prevent the use of modern materials-handling equipment.

But when realistic price tags on all the factors listed above are added up, some industries will find it cheaper to replace an obsolete building with a new one on a city site, than to move to a small town.

For many industries which need to be in big cities, multi-story modern buildings and underground parking are economically feasible. Prestressed concrete has raised the limits of floor loads and bay widths. Vertical material movement has new applications, and the force of gravity is still free.

On the other hand the difference in the length of the lists of big-city and the small-town advantages doesn't mean that the big city has the generally stronger pull. In many cases the first four items on the small-town list outweigh all 14 items on the big-city list.

In recent writings and discussions of plant location, however, the advantages of the small town and the small city have been more effectively presented than the advantages of the big city. Local, state, and regional groups have promoted the smaller communities, where industrial property could be acquired and local support for development programs enlisted with relative ease. Most of the larger cities, already industrialized, short of suitable vacant land, and facing many other pressing problems, have lacked strong and unified industrial programs.*

*The above is extracted from an address by Stuart P. Walsh, Director of Industrial Planning Associates, to the Peninsula Chapter of the American Institute of Industrial Engineers.

APPENDIX 5

ASSEMBLY TYPE PLANTS IN GEORGIA

Product	Company Name	Location
Automobiles	Ford and General Motors	Atlanta area
Aircarft	Lockheed Aircraft Corp.	Marietta
Road building equipment	Le Tourneau-Westinghouse Co.	Toccoa
Mobile homes	Eleven firms in different parts of the state	
Truck trailers	Great Dane Trailers, Inc.	Savannah
Garden tractors	Gravely Tractor Company	Albany
Elevators	Southeastern Elevator Co.	Atlanta
Elevator bodies	Cook and Company	Hazelhurst
Transformers	General Electric Company Westinghouse Electric Co.	Rome Athens
Boilers	Babcock & Wilcox Company	Brunswick
Cotton gins	Lummus Cotton Gin Company	Columbus
Bottling and bottle washing equipment	Miller Hydro Company	Bainbridge
Presses	Harris Foundry & Machine Co.	Cordele
Material handling equipment	Link-Belt Company Jervis B. Webb & Co. of Ga.	Atlanta Atlanta
Log debarkers	Fulghum Industries	Wadley
Vending machines	Damar Company	Marietta

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